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THE RED CROSS AND THE ANTIVIVISECTIONISTS:

AN APPEAL TO THE FAMILIES AND FRIENDS OF OUR HEROIC TROOPS AND TO THE COMMON SENSE OF THE AMERICAN PEOPLE

FIRST of all let me make two facts clear.

1. This paper has been written entirely on my own responsibility and not at the suggestion directly or indirectly of the Red Cross. I have been moved to write it solely in the interest of our brave soldiers, and especially because their sufferings and lives are involved in the suit against the Red Cross by the antivivisectionists to prevent the use of \$100,000 of the Red Cross funds in such beneficent life-saving researches.

2. The Red Cross as an organization is neither an opponent, nor an advocate, nor a defender, of vivisection. It states officially that the *supreme* aim of the Red Cross is to *relieve human suffering* [and it might well have added "and to save thousands of human lives"]].

The War Council was advised from the ablest sources available that an immediate appropriation for medical research would contribute to that end. The War Council could not disregard such advice.

They then refer to the many unsolved medical and surgical problems that have arisen from wholly new conditions and methods of warfare. Letters from a number of my own surgical friends in France emphasize and the medical journals teem with papers on these new problems. They relate to the treatment of the horribly infected wounds—and practically *all* wounds are of this kind—never met with in civil surgery; to the treatment of "trench

fever"—a peculiar form of fever never before seen; of "trench heart"; of "trench foot," often followed by lockjaw; of "trench nephritis" (inflammation of the kidneys); gas gangrene; tetanus; shell shock; poisonous gases; fearful compound fractures, especially of the thigh, etc. Every man enabled to return to active duty as a result of solving these problems helps to win the war. Every man who dies, or is permanently disabled because of our ignorance, hinders our winning the war.

It must be remembered that our surgeons, physicians and physiologists over there are the very flower of the American medical profession. These fine men under the supervision of the Medical Staff of the United States Army, superintend all the work. Nothing is done that has not the direct approval of Brigadier General A. E. Bradley, U. S. Army.

Experiments on animals form a necessary but a minor feature of the researches.

The animals used are principally guinea-pigs, rabbits and white rats. If operations causing pain to animals are performed, anesthesia is used.

This certainly does not suggest "cruelty" or "torture."

I appeal to the common sense of the American people and especially to the families and friends of our brave soldier boys: Which do you prefer (1) That our soldiers shall be protected from attacks of these new (as well as of the familiar) diseases, their sufferings lessened or even prevented, and their lives saved, or (2) will you insist that not a single guinea-pig, rabbit or rat shall suffer the slightest pain or lose its life, in researches to lessen the suffering and save the lives of our soldiers?

Remember, if you choose the second you deliberately condemn your son, brother, or husband to sufferings far beyond any suffering of these animals. In many cases, as

I shall show, you will condemn your dear one to death, and in some cases a horribly painful death.

In the "Bill of Complaint" of the Antivivisectionists, seven grounds of opposition to vivisection are mentioned. The sixth reads as follows:

That although it [vivisection] has been practised for many years, *nothing has been discovered by means of it that is at all beneficial to the human race.*

This is the crux of the whole matter. If this were true I would vigorously oppose vivisection myself.

I entered upon my medical studies in 1860. I took part in the horrible surgery of the Civil War—as we now know it was. I have taught anatomy and surgery to not far from 10,000 students. I taught and practised the old dirty surgery—the only kind we then had—up to October 1, 1876. Since that date I have practised and taught the new antiseptic surgery, which has been created by researches similar to those now proposed. Since the great war began I have diligently studied the newest surgery. I submit, therefore, that I may be presumed to be fairly familiar with these three stages of surgery. Let me give now a few examples of some of the things that HAVE "been discovered by it [vivisection]" and that "*are* beneficial to the human race."

I may remark in passing that animals themselves have benefited by the same means, almost, and possibly quite as much as the human race.

1. *Typhoid Fever*.—This has been one of the historic scourges of armies. In 1880 the bacillus—the cause of the fever—was discovered. It was soon proved that the disease was spread through infected milk, infected water, and very largely by the house-fly. The last, after walking over the excrement of a typhoid patient, and then walking over our food, conveyed the dis-

ease. Prevention of contamination by these three means—sanitary measures based on the discoveries of bacteriology prevent the disease to a large extent. But our real triumph over the disease was not achieved until lately.

I may here call attention to the fact that the antivivisectionists entirely reject bacteriology, a science which has disclosed to us the causes of many diseases, and has enabled us to prepare antitoxins to neutralize the poisons developed by these bacteria. Without bacteriology the physician and the surgeon to-day would be as helpless as a mariner without a compass.

	Cases	Deaths
During the Civil War typhoid fever resulted in.....	79,462	29,336
In the Boer War there were..	58,000	8,000
(In that war the total number of deaths was 22,000. Typhoid alone, therefore, was responsible for more than one third of all the deaths!)		
In our war with Spain there were	20,738	1,580
Our Army numbered 107,973 men. Therefore every fifth soldier fell ill with typhoid in 1898! Over 86 per cent. of <i>all</i> deaths in this war were due to typhoid!!		

During the Boer War imperfect attempts were made to control typhoid by an anti-toxin similar to that against diphtheria, which has saved such multitudes of children. Gradually the method has been improved so that in our army it was at first recommended as a voluntary protection (1909). The results were so favorable that in 1911 it was made compulsory. It has been said that it should still be voluntary. But as every case of typhoid imperils the health and life of multitudes we surely have a right to make it compulsory so as to protect all the rest. All that is necessary

to prove this is to look at these tables of cases and deaths in our Army and Navy.

TYPHOID FEVER IN THE UNITED STATES ARMY

Year	Cases	Deaths
1906	210	12
1907	124	7
1908	136	11
1909	173	16

ANTI-TYPHOID VACCINATION MADE COMPULSORY

1911	70	8
1912	27	4
1913	4	0
1914	7	3
1915	8 ¹	0

TYPHOID FEVER IN THE UNITED STATES NAVY

1909	189	17
1910	193	10
1911	222	15

ANTI-TYPHOID VACCINATION MADE COMPULSORY

1912	57	2
1913	22	4
1914	13	0
1915	15	1

On the Mexican border, though the fever was rife near the camps, only *one man* out of 20,000 troops, a civilian, who unfortunately escaped vaccination, fell ill with it.

Now let us see the results in the armies in the present war.

In the British armies, on March 1, 1917, Mr. Forster, Under Secretary for War, stated in the House of Commons that

The last weekly returns showed only twenty-four cases in the four British armies in France, Salonica, Egypt and Mesopotamia. He added that the total number of cases of typhoid fever in the British troops in France down to November 1, 1916, was 1,684, of para-typhoid,² 2,534, and of indefinite cases, 353, making a total of 4,571 of the typhoid group.

Now the English armies number at least 5,000,000. If they had suffered as our

¹ Four in the United States; 4 in Hawaii.

² A form of fever caused by a bacillus somewhat similar to the typhoid bacillus but causing a much milder infection.

Army did in 1898 there would have been 1,000,000 cases! In fact there have been less than 4,600! Besides that, the percentage of fatal cases in the inoculated men was 4.7 per cent., in the uninoculated 23.5 per cent.; and perforation of the bowel, the most dangerous complication, occurred *six times more frequently* among the unvaccinated than among those who had been protected. In the British armies the anti-typhoid vaccination is still voluntary but over 90 per cent. are thus protected. If it had been compulsory, hundreds of the 4,571 *who died would have been saved!*

In our own army in over four months (September 21, 1917, to January 25, 1918) a period one month longer than our war with Spain (the Surgeon General's Office gives me the official figures), we have had an average (*i. e.*, every day of these four months), of 742,626 men in our cantonments and camps. These men have come from all over the country, in many cases from where autumnal typhoid was reaping its annual harvest, in practically all cases unprotected by the vaccination. Between these two dates there have been 114 cases of typhoid and 5 of paratyphoid. *Had the conditions of 1898 prevailed there would have been 144,506 cases instead of 119 in all!* The reason is clear. The men were all immediately vaccinated against typhoid, paratyphoid and smallpox.³

Besides this as soon as the antityphoid inoculation was completed the number of cases rapidly fell and from December 14 to January 25—6 weeks!—there have been only 6 cases of typhoid and one of paratyphoid among probably now nearly 1,000,000 men! Truly marvellous!

Now all this is the *direct result of bacteriological laboratory work*. Was it not

³ Of the latter disease there have been only 4 cases, all unvaccinated.

worth while? Has it not "benefited the human race"? Are you not glad that *your* son is thus protected?

I may add that the German armies show a similar absence of typhoid. I have seen no figures but only general statements.

Tetanus or "Lock-jaw."—Few people realize what terrible suffering this disease causes. The mind of the patient is perfectly clear, usually to the very end, so that his sufferings are felt in their full intensity. All of my readers have had severe cramps in the sole of the foot or calf of the leg. The pain is sometimes almost "unbearable." In tetanus not the muscles of the jaw alone are thus gripped, but the muscles all over the body are in cramps ten or twenty fold more severe, cramps so horrible that in the worst cases the muscles of the trunk arch the body like a bridge and only the heels and the head touch the bed!

Never shall I forget a fine young soldier during the Civil War who soon after Gettysburg manifested the disease in all its dreadful horror. His body was arched as I have described it. When at intervals he lay relaxed, a heavy footstep in the ward, or the bang of a door, would instantly cause the most frightful spasms all over his now bowed body and he hissed his pitiful groans between tightly clenched teeth. The ward was emptied, a half-moon pad was hung between the two door-knobs to prevent any banging; even the sentry, pacing his monotonous steps just outside the ward, had to be removed beyond earshot. . . . The spasms became more and more severe, the intervals shorter and shorter; it did not need even a footfall now to produce the spontaneous cramps, until finally a cruelly merciful attack seized upon the muscles of his throat and then his body was relaxed once more and forever. He had been choked to death.

Do you wonder at the joy unspeakable which we surgeons have felt of late years as we have conquered this fearful dragon? In 1884 the peculiar germ, shaped like a miniature drum-stick, was discovered. Its home is in the intestines of animals, especially of horses. The soil of France and

Belgium has been roamed over by animals and manured for over 2,000 years, even before Julius Cæsar conquered and praised the Belgians. The men in the trenches and their clothing are besmeared and bemired with this soil, rich in all kinds of bacteria, including those of tetanus, gas gangrene, etc. When the flesh is torn open by a shell, ragged bits of the muddy clothing or other similarly infected foreign bodies are usually driven into the depths of the wound. Now the tetanus bacilli and the bacilli of "gas-gangrene" are the most virulent of all germs. It takes 225,000,000 of the ordinary pus-producing germs to cause an abscess and 1,000,000,000 to kill, while 1,000 tetanus bacilli are enough to kill. This readily explains the frightful mortality of tetanus during the Civil War. It killed 90 patients out of every hundred attacked.

In the early months of the Great War the armies suddenly placed in the field were so huge that there was not a sufficient supply of the antitoxin of tetanus. Hence a very considerable number of cases of tetanus appeared. Now it is very different. At present every wounded soldier, the moment he reaches a surgeon is given a dose of antitetanic serum. As a result, *tetanus has been almost wiped off the slate*. I say "almost," because to be effective the serum must be given within a few hours. The poor fellows who lie for hours and even days in No Man's Land can not be reached till too late. All the surgeons on both sides concur in saying that tetanus, while it still occurs here and there, has been practically *conquered*.

Every step of this work has been accomplished by the bacteriologists and the surgeons working together in the laboratory and the hospital.

Would you seriously advise that no such experimental researches should have been

carried on and that your boy should suffer the horrible fate of my own poor Gettysburg boy? Confess honestly, are not these and other similar researches to be described as humane?—as desirable?—nay, as imperative?

But the antivivisectionists declare that bacteriology is false—that such vaccination is "filling the veins with 'scientific filth' called serum or vaccine"! They are doing their best to persuade our soldiers not to submit to any such "vaccination"!

Nay, more "we feel," say forty-one of our medical officers on duty in France, "that any one endeavoring to stop the Red Cross from assisting in its humanitarian and humane desire to prevent American soldiers from being diseased, and protecting them by solving the peculiar new problems of disease with which the Army is confronted *is in reality giving aid and comfort to the enemy*."

Small-pox.—The word vaccination leads me to say a word about small-pox. I confess that I *was* amused by a recent paper in an antivivisection journal entitled "Vaccination as a *Cause* of Small-pox"! During the last year hundreds of thousands of soldiers have been vaccinated against small-pox. Surely there should have been *some* cases of that disgusting disease if it were caused by vaccination.

But what are the facts? I have just received the Report of Surgeon General Gorgas for 1917. The section on Small-pox reminds one of the celebrated chapter on "Snakes in Ireland." On p. 81 on Small-pox in the Army in the United States, I read "*No* cases of small-pox occurred within the United States proper during the year." On p. 175, I read "*No* cases [of small-pox or varioloid] occurred in the islands" [among the American troops in the Philippines]. On p. 188, I read under Small-pox that "nine cases occurred

during the year" [among the Philippine Scouts].

My friend and former student, Dr. Victor G. Heiser, as director of health in the Philippine Islands for years, vaccinated over 8,000,000 persons without a death—and with what result? In and around Manila the usual toll of small-pox had been 6,000 deaths and about 25,000 cases annually. In the twelve months after his vaccination campaign was finished there was *not one death* from small-pox.

Per contra, in 1885 in Montreal, as stated by Osler, one Pullman porter introduced small-pox into a largely *unvaccinated* city. There followed 3,164 deaths and enormous losses to the Montreal merchants.

But why say more? We all know that a single case in any community causes every intelligent person to be protected by vaccination.

Gas-Gangrene.—One of the terrible and new surgical diseases developed by this war is called "gasgangrene." It has no relation to the poisonous gases introduced by the barbarous Germans at Ypres. About twenty-five years ago Professor W. H. Welch, of the Johns Hopkins Hospital, discovered a bacterium which *produced gas* in the interstices between and in the muscles. This bacillus does not occur in Great Britain. I never saw a case of gasgangrene in the Civil War, and but one case since then in civil practise. On the contrary in Belgium and France in the soil and, therefore, on the clothing and on the skin of the soldiers these bacilli abound. From what Bashford calls the "cess-pool of the wound" the germs travel up and down in the axis of the limb. If it escapes from a puncture it will take fire from a match. Gas has been observed within five hours. An entire limb may become gangrenous within sixteen hours. If the whole limb is

amputated the gas may be so abundant that the limb will float in water! Death is not long delayed.

Now your son in France runs a very serious risk of becoming infected with this deadly germ. Would you be willing positively to forbid any experiments on animals which could teach us how to recognize this infection as early as possible? Would you forbid any experiments which might teach us how to *conquer* or better still to *prevent* this virulent infection and save his life? Which would you prefer should suffer and very possibly die, a few minor animals or your own son? If a horse or a dog or even a tiny mouse can help in this sacred crusade for liberty and civilization, if it even suffers and dies, is it not a worthy sacrifice? Should they be spared and our own kith and kin give up their lives?

I need not wait for a reply! I am sure you would say "My boy is worth 10,000 rabbits or guinea-pigs or rats! Go on! Hurry, hurry! and find the remedy." That is *true* humanity which will save human lives even at the expense of some animals' lives.

Now see the result. By careful observation and experiments with different remedies the surgeons have discovered valuable methods of treatment. But very many still die. *Prevention* is always far better than cure. At the Rockefeller Institute Drs. Bull and Ida W. Pritchett have discovered a serum which in animals *prevents* this gasgangrene and yet does no harm to the animal. It is now being tried on the soldiers in France.

Again I ask: Is it not our duty even to *insist* on such experiments so that our troops may be spared the dreadful suffering and even death following this virulent infection? If the Bull-Pritchett serum proves ineffective should not our efforts be redoubled? The common sense of the

American people will reply: "Yes, by all means. You will be recreant to humanity and to your duty if you do not."

Modern Surgery.—"Lister," in Howard Marsh's fine phrase "opened the gates of mercy to mankind." Pasteur and Lister are the two greatest benefactors of the human race in the domain of medicine. I am not sure but that I might even omit the last five words.

The *revolution* which Lister produced in surgery is so well known to every intelligent person that I need only say a few words. Forty years ago a wholly new surgical era was inaugurated by Pasteur and Lister. In the Civil War there were recorded 64 wounds of the stomach and only *one* recovered. Otis estimated the mortality at 99 per cent. In over 650 cases of wounds of the intestines there were only five cases of recovery after wounds of the small bowel and 59 from wounds of the large bowel—together only 64 out of 650 recovered, *i. e.*, over 90 out of every 100 died!

The complete statistics of the present war can not be tabulated and published for some years. I give, however, the result of one series of abdominal gunshot wounds as a contrast, on a far larger scale and in far worse wounds. Out of 500 such operations, 245 *recovered!* and only 255 died! Contrast 51 per cent. of deaths in these wounds with mutilation and infection unutterably worse than in the Civil War, with 99 per cent. of deaths, according to Otis.

Is not this a triumph of bacteriological and surgical research? Would you prohibit similar researches now when your boy's life may be saved by them?

Is not this one of the things that *have "been discovered"* by vivisection and has not such change in surgical treatment been of "*benefit* to the human race"? In all honesty would you be willing to have your

son treated as I myself (may God forgive me!) ignorantly treated hundreds during the Civil War?

This advance I do not *think* or BELIEVE, but I KNOW is due to Pasteur and Lister and their followers. I know it by personal experience just as you know the high cost of living, the shortage of sugar and the scarcity of coal.

The bacteriology which the antivivisectionists scorn and reject I KNOW is the CORNERSTONE of modern surgery. Before Lister's day out of 100 cases of compound fracture 66 died from infection. Now *less than one* out of 100 die. Before Lister my old master in surgery, Dr. Washington L. Atlee, one of the pioneers in practising ovariectomy, lost two out of every 3 patients—now only two or three in a hundred die. Before Lister we never *dared* to open the head, the chest or the abdomen unless they were already opened by the knife, the bullet or other wounding body. Now we open all of these great cavities freely and do operations of which the great surgeons of the past never dreamed in the wildest flights of their imagination. Could they return to earth they would think us stark crazy until they found that the mortality was almost negligible and the lives saved numbered hundreds of thousands.

I have given but a few instances of the many wonderful benefits which have resulted from medical research in every department of medicine. But I believe they are sufficiently convincing. I can sympathize with the deep feelings of those who wish to spare pain to animals, but is it not a higher and more imperative, a holier sympathy that has spared and will spare pain eventually to human beings and also to other animals in uncounted numbers?

Do you wonder that after over forty years of steady practise, teaching and writing I assert, conscious of the great responsi-

bility of my words, that "I regard experimental research in medicine as a medical, a moral and a Christian *duty* towards animals, towards my fellow men and towards God."

There is so much yet to be learned chiefly, by experimental research. So many devoted lives to be saved to our country and to mankind if we only knew how! Do you wonder that I am in dead earnest?

Finally. What have the antivivisectionists themselves done to diminish sickness and save life?

A. In animals? Absolutely nothing.

In spite of the enormous ravages of animal diseases causing enormous suffering to animals and costing this country \$215,000,000 every year, not a single disease has had its ravages diminished or abolished as a result of anything *they* have done. But medical research is saving every year thousands of animals from anthrax, hog cholera, chicken cholera, Texas fever and other diseases.

B. In human beings? Absolutely nothing. I do not know a single disease of human beings which has had its ravages checked, abated or abolished by any work ever done by the antivivisectionists.

The only thing they *have* done has been to throw as many obstacles as possible in the path of those who are striving to benefit both animals and men.

This present suit is characteristic.

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SOME OPINIONS ON COLLEGE PHYSICS TEACHING

ORIGINALLY the whole of science, physics has come by specialization to have for a central interest the relations of energy to matter, motion, heat and electricity; it lies, not sharply

bounded, among astronomy, chemistry, the biological and earth sciences, and their applications in engineering and agriculture. From it all these draw fundamental data, and from it new branches continually develop. The history of this development is very interesting and instructive; it forms one phase of the intellectual development of humanity, and should be known to all students whose interests are at all higher than the bread-and-butter level.

It has been said that science is common sense. That is incompletely true; for *common* sense results from *common* experience, and can hardly deal with uncommon or new situations. From this arises one of the difficulties which to many people make physics a repulsive subject. It deals with facts of all sorts, from bearing friction and the flow of water in pipes to the flight of wireless waves and the rotation of nebulae, and has to adopt a viewpoint which can not be that of common experience; for observations on most of this vast range are not commonly made, and not by common people. Newton's three laws of motion, for example, are not expressions of common sense; otherwise they would not have been reserved for Newton to state. They are known not to be in conflict with common experience; they include it; but the average person has not had the uncommon astronomical and laboratory experiences necessary for their discovery or appreciation. Hence the mechanics based on them seems stale and dry, metaphysical, out of connection with experience.

The subject of physics being thus vast, not clearly defined and to a certain extent removed from common experience, only a part of it can be taught in elementary courses. What this part shall be has to be decided with an eye on two things; it must seem worth while to the student, and it must expand his horizon of experience, so that the great general laws which have been discovered shall seem to him to spring naturally from the behavior of matter. To seem worth while to a student, the subject-matter of a course must build upon what he already knows, and must have evident bearing upon the problems which he knows he will have to solve. He has had experience with crow-